REMARKS

This Amendment and Response is filed in reply to the Final Office Action mailed September 6, 2006 and the Advisory Action mailed November 21, 2006. Claims 1-20 were previously pending in this application. Claims 1-20 stand rejected. Claims 1 and 11 are amended. Claim 21 is added. No claims are canceled. No new matter is added.

Applicant's silence with regard to the Examiner's rejections of dependent claims constitutes a recognition by the Applicant that the rejections are moot based on Applicant's Remarks relative to the independent claim from which the dependent claims depend. Applicant reserves the option to further prosecute the same or similar claims in the present or a subsequent application. Upon entry of this amendment and response, claims 1-21 are pending in the present application, of which claims 1, 11, 19 and 21 are independent.

Claim Rejections - 35 U.S.C. § 103(a)

The Examiner rejected claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over Stevenson et al. (U.S. Patent No. 6,738,388), Soltis et al. (U.S. Patent. No. 6,493,804) and further in view of Wadsworth et al. (U.S. Patent. No. 6,067,407). Applicant disagrees and traverses the rejection.

Applicant notes that sections 1-15 and 18-21 of the Final Office Action mailed September 6, 2006 are verbatim copies of sections 1-19 of the Office Action mailed March 15, 2006. Accordingly and where appropriate, Applicant reiterates the arguments set forth in Applicant's response dated June 13, 2006. In the Advisory Action, the Examiner asserts that Applicant's request for reconsideration does not place the application in condition for allowance by repeating the Examiner's remarks in section 17 of the Final Office Action. Applicant's following remarks address the Examiner's assertions in sections 16 17 of the Final Office Action and in the Advisory Action.

Applicant's independent claims

Applicant's independent claim 1 is directed to a method of modifying processing on at least one control device controlling operation of process control equipment. In general,

the method recited in claim 1 enables a download operation to be performed robustly. The download is performed by transferring data, as further described in Applicant's independent claim 1, and then storing the transferred data in an inactive memory area. By transferring during unscheduled communications periods and storing the data to an inactive area of the memory of the control device, any and all operations of the control device, which use active memory areas, are not affected while the transfer and storage occur. The control device microprocessor is directed to execute the stored data during an idle period of the microprocessor, thus achieving the installation of the downloaded data and so modifying the processing of the control device. In this way, it is possible to achieve the remote updating of, for example, control devices in large chemical plants, while allowing those control devices to continue their current operations. Neither Stevenson et al., Soltis et al. nor Wadsworth et al., alone or in combination, teach or suggest such a method.

Applicant's independent claim 11 recites a system for modifying processing on at least one control device. The system includes features corresponding to the method recited in independent claim 1, including a remote host device coupled through a Fieldbus communications network to the at least one control device and configured to transfer data to the at least one control device during unscheduled communications periods between the at least one control device and control equipment of at least one process controlled by the at least one control device and without interrupting operation of the at least one control device, and at least one control device. The control device includes at least one active memory area and at least one inactive memory area, at least one control device microprocessor to execute instructions and data in the at least one active memory area and a control device selector module to direct the at least one control device microprocessor to the at least one active memory area. The selector module includes a scheduling module to redirect the at least one control device microprocessor during microprocessor idle periods to modify the processing on the at least one control device.

Applicant's independent claim 19 recites a method of implementing a software upgrade for a control device. The method includes features similar to those of the method recited in independent claim 1, including transferring, without interrupting operation of the

control device, software upgrade data from a remote host device to the control device during unscheduled communications periods between the control device and control equipment of at least one process controlled by the control device, wherein the remote host device and the control device are coupled through a Fieldbus communications network. The method recited in claim 19 further includes storing the upgrade data to a respective inactive memory area and redirecting at least one microprocessor of the control device, during an idle period of the at least one microprocessor, to execute the stored upgrade data in the inactive memory area to implement the software upgrade for a next active period of the microprocessor.

New claim 21 recites a method for modifying processing on at least one control device. The method comprises transferring data from a remote host device to the at least one control device without interrupting operation of the at least one control device and during unscheduled communications periods between the at least one control device and control equipment of at least one process controlled by the at least one control device. The remote host device and the at least one control device are coupled through a Fieldbus communications network. The method also includes storing the transferred data to a respective inactive memory area and redirecting at least one control device microprocessor during an idle period to execute the stored data in the inactive memory area to modify the processing on the at least one control device, wherein the idle period includes a period when the microprocessor is not actively controlling the control equipment and when the microprocessor is not actively processing data from the control equipment. The microprocessor implements the modified processing for a next active period of the microprocessor with respect to the control equipment.

Accordingly, each of Applicant's independent claims includes limitations regarding transferring data *from a remote host device* to a control device *during unscheduled communications periods* and *without interrupting the operation of the control device*. In addition, each of the independent claims includes directing a microprocessor of the control device to execute the data *during an idle period of the microprocessor*.

With regard to Stevenson et al.

The Examiner asserts (sections 2 and 14 of the Final Office Action) that Stevenson et al. disclose transferring data from a remote host device to a control device during unscheduled communications periods and without interrupting operation of the control device (col. 21, line 51 to col. 22, line 19 and col. 7, lines 12-27) In responding to Applicant's remarks, the Examiner asserts (section 20 of the Final Office Action) that "any device external to the network [may be] represented as a remote device" (referring to communication between shadow function blocks and external function blocks in Stevenson et al., col. 17, line 66 to col. 18 line 5). The Examiner further asserts (section 16 of the Final Office Action) that "one [of] ordinary skill in the art at the time of the invention knows that when the two devices are communicating, one device will represent as a part that request[s] and the other device will represent as a processor device[, w]here one device act[s] as a controller and the other device act[s] as a processor also called a host device." Applicant disagrees with the Examiner's assertions.

As provided in Applicant's previous replies, communication between the internal and external function blocks in Stevenson et al. take place between the controller 12 and field devices, e.g., 43, 44, 46 and 48. While one can argue that any one of two separate devices in communication with each other can be considered remote relative to one another, this is not what Applicant claims. Applicant's independent claims recite communications between a *remote host site* and a *control device*, not between the control device and the control equipment or field devices it controls. To further the Examiner's understanding, Applicant directs the Examiner's attention to claim 19. In addition to the transferring of data from a remote host site to the control device, claim 19 recites that communications occur *between the control device and control equipment of at least one process controlled by the control device*.

Applicant submits that, even if one attempted to relate the communications described in Stevenson et al. to Applicant's communications, the communications between a controller and field devices in Stevenson et al. would only relate to Applicant's communications

between the control device and control equipment. Accordingly, one of skill in the art would not consider the communications between the controller and the field device, or sensor (col. 18, lines 15-17) as disclosed in Stevenson et al., as a disclosure of a communication between a *remote host site* and a *control device*, as recited by Applicant. In order to move prosecution forward, Applicant amends claim 1 to recite that the control device controls the operation of process control equipment. Applicant respectfully requests reconsideration in light of the amendment to claim 1.

Further with regard to Stevenson et al., the Examiner asserts (section 20 of the Final Office Action) that Stevenson et al. disclose "communications between the actual function block and the shadow block occur automatically without the intervention by the process control routing" (col. 18, lines 63-66). In response to Applicant's remarks, the Examiner asserted (section 17 of the Final Office Action) that Stevenson et al. disclose that "the shadow function block communicates with the external function block using the communication protocol associated with the external function blocks which may be, and typically is, different than the controller configuration protocol used by the controller to implement communications between the function blocks internal to the controller" and that "one of skill in the art at the time of the invention [would] interpret the unscheduled communication 'as first come first serve[d]' that means regular communication. Again, Applicant disagrees with the Examiner's assertions.

It is not clear to Applicant how the Examiner relates the communications that occur automatically without intervention in Stevenson et al. to Applicant's unscheduled communications periods. Applicant has previously noted that the communication cited by the Examiner occurs between the function block 112 of an external device, such as a sensor, and the shadow function block 108 of the controller 12. In having communications occurring automatically and without intervention by the control process routine, Stevenson et al. do not state nor imply that data is transferred during unscheduled communications periods. To the contrary, automatically occurring communications require scheduled communications. Further, the fact that communications occur without intervention by the

control process routine does not imply that the communication does not interrupt the operation of the control device.

Nor is it clear to Applicant how communicating with the external function block using a communication protocol different than the protocol used by the controller relates to Applicant's unscheduled communications periods. The communication protocol used in Stevenson et al. does not change the fact that the communications occur automatically without intervention, which, as provided in the above remarks, is contrary to Applicant's unscheduled communications period.

Applicant also submits that the interpretation of an unscheduled communication as a "first come first serve" communication, whether or not valid, is not pertinent to Applicant's claims. Applicant recites that the remote host site transfers data to the control device during unscheduled communication periods. Again, Applicant directs the Examiner's attention to claim 19, which explicitly states that the transfer of data from the remote host site to the control device occurs during an unscheduled communication period *between the control device and control equipment*. Stevenson et al. do not teach or suggest a transfer of data between a first and second device (Applicant's remote host site and the control device), which occurs during an unscheduled communication period between the second device and a third device (Applicant's control device and the control equipment). It is implicit in both claim 1 and claim 11 that the unscheduled communication period refers to communication between the control device and control equipment, or at the least a device other than the remote host site. However, to move prosecution forward, Applicant amends claim 11 to explicitly recite the transfer of data during unscheduled communications periods *between the at least one control device and control equipment*. Applicant respectfully requests reconsideration in light of the amendment to claim 11.

In addition, the Examiner has not provided any further showing of how communicating without intervention by the control process routine does not interrupt the operation of the control device, particularly if the communication is for transferring data for modifying operation of the control device. Nor could Applicant discern any response to

Applicant's remarks regarding Stevenson et al. teaching away from Applicant's method. As stated in Applicant's previous responses, Stevenson et al. disclose configuring function blocks within devices by setting the function block mode to "out of service", so as to change values within the function block. (See col. 26, lines 11-20 and Fig. 10.) As the function block is "out of service", the device cannot perform its process control function using the function block and accordingly the operation of the device is interrupted. Accordingly, Stevenson et al. do not teach transferring data for modifying processing of a control device without interrupting operation of the control device. In fact, Stevenson et al. teach that setting the function block mode to out of service is necessary to change values within the function block (col. 26, lines 18-20), thus teaching away from or against Applicant's method of *transferring data without interrupting operation*, as recited in the claims.

Applicant submits that the above remarks clearly demonstrate that, at the least, Stevenson et al. do not teach or suggest transferring data from a remote host device to a control device during unscheduled communications periods and without interrupting the operation of the control device. Further, the Examiner fails to cite, and Applicant fails to find, any such teaching or suggestion in either Soltis et al. or Wadsworth et al. Accordingly, Applicant submits that claims 1, 11 and 19 are patentable over the cited references, alone or in combination and that the assertions with regard to Soltis et al. and Wardsworth et al. are moot. Applicant notes that the Examiner's assertions and remarks regarding Soltis et al. and Wardsworth et al. are verbatim copies of those of the Office Action mailed March 15, 2006. Accordingly, they do not address the remarks in Applicant's response filed June 13, 2006. However, for completeness of the current response, Applicant reiterates the remarks previously presented.

With regard to Soltis et al.

The Examiner contends that the patent to Soltis et al. is in the same field of endeavor as that of Stevenson et al. and that Soltis et al. disclose SCSI Mode and Mode select commands that allow access to and modification of a SCSI-defined Device Locks mode page on a storage device, which are used for configuring the device locks and that typically

include several SCSI-defined pages of configuration data (col. 25, lines 21-31; col. 24, lines 48-58). The Examiner appears to assert that the SCSI Mode and Mode select commands of Soltis et al. provide for redirecting a control device microprocessor during an idle period of the control device microprocessor.

It is unclear from the cited reference how this disclosure in Soltis et al. relates to redirecting a microprocessor during an idle period. In section 18 of the Examiner's response to Applicant's arguments, the Examiner contends that since the commands are used for configuring several SCSI-defined pages of configuration data, one of skill in the art "can interrupt the SCSI device as control device with microprocessor." In section 21, the Examiner contends that based on the commands, one of skill in the art "interrupted [sic] the inactive memory as any storage device that has storing capability."

As it stands, Applicant fails to understand the contentions put forth by the Examiner. To the extent that the Examiner's reasoning and assertions can be discerned, Applicant respectfully disagrees with the Examiner's assertions. If the Examiner intends in section 19 that one of skill in the art would interpret the inactive memory as any storage device that has storing capability, then this contention does not show a teaching of *redirecting at least one control device microprocessor, during an idle period of the at least one control device microprocessor*. Soltis et al. merely states that the SCSI Mode and Mode select commands allow access to and modification of a SCSI-defined Device Locks mode page on a storage device. There is no teaching or suggestion in Soltis et al. that the commands redirect a microprocessor to perform the modification of the mode page during an idle period of a control device.

Further, as those of skill in the art are aware, when a device is interrupted, it ceases its current operation to perform the task required by the interruption. It is superfluous to speak of interrupting a device during an idle period, since there is no operation to interrupt. Accordingly, the alleged fact that Soltis et al. teach that one "can interrupt the SCSI device" with a microprocessor serves to show that Soltis et al. teach away from redirecting the microprocessor *during an idle period*, since one does not interrupt an idle period. The

Examiner has not responded to Applicant's remarks regarding Soltis et al. teaching away from Applicant's method, nor provided any support for the contention that interpreting an inactive memory as any storage device teaches *redirecting at least one control instrument microprocessor during an idle period of the at least one control instrument microprocessor.*

With regard to Wadsworth et al.

While the Examiner has acknowledged that neither Stevenson et al. nor Soltis et al. disclose executing the stored data in the inactive memory to modify processing on a control device, the Examiner asserts that the patent to Wadsworth et al. is in the same field of endeavor, that Wadsworth et al. disclose the capability of the MLID to retrieve and store data at indicated locations in the memory of the network interface controller (col. 11, lines 26-28) and that Enter Data is used to modify the data values, to modify the process steps, to set break points for subsequent initiation of execution of the interactive debugger (col. 13, lines 26-29). Applicant disagrees.

While debuggers can set break points in software, such break points interrupt the software execution to perform dumps, run debug facilities, or the like at the set break points (Fig. 7, ref. no. S702). Thus, Wadsworth et al. cannot be said to transfer data without interrupting operation. Further, the Enter Data function operates within the debug routine. In preparing to debug a software program, or during the debug operation, an operator can use the Enter Data function to modify data values, set break points and the like. As noted, software execution is interrupted during the debug operation. Thus, the Enter Data function is incompatible with the method recited in claim 1.

Additionally, Applicant disagrees that Wadsworth et al. is in the same field of endeavor as is Stevenson et al., or as Applicant's method. Stevenson et al. describe a process controller, while Wadsworth et al. describe a remote diagnosis utility for software routine debugging. Outside of a general relationship dealing with software and networks, Applicant fails to see the connection. While one of skill in the art may use a debugger with many different types of applications, the Examiner has not provided support for the assertion that Wadsworth et al. may be combined with Stevenson et al. or Soltis et al. to *redirect a*

control device microprocessor, during an idle period of the control device microprocessor, to execute data stored in an inactive memory area so as to modify processing on a control device. At a minimum, Applicant respectfully requests that the Examiner provide his reasoning as to how the diagnosis utility of Wadsworth et al. has application to the process control network of Stevenson et al. and particularly to modifying the processing of the controller in Stevenson et al. during an idle period of the controller microprocessor.

Obviousness

As set forth in MPEP §2143, three criteria must be met in order to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the cited reference(s) or in the knowledge generally available to one of ordinary skill in the art, to modify the cited reference(s) or to combine reference teachings (if multiple references are cited). The teaching or suggestion to modify the reference(s) or to combine reference teachings, as well as the reasonable expectation of success, must both be found in the prior art and not based on Applicant's disclosure. Second, there must be a reasonable expectation of success. Third, the prior art reference(s), when viewed as a whole, must teach or suggest all of the claimed features. Failure to meet any one of these criteria – a teaching or suggestion of all claim elements, a specific suggestion or motivation to modify or combine the prior art, and a reasonable expectation of success – is sufficient to render an obviousness rejection improper. Applicant submits that the above remarks with respect to the references clearly establish that Stevenson et al., Soltis et al. and Wadsworth et al., alone or in combination, do not teach or suggest all of the elements of the claims. Accordingly, the third criteria for establishing obviousness is not met by the references.

Stevenson et al. describe a process controller communicatively coupled to external field devices via a communication network. A shadow function block within the process controller communicates with an external function block in a field device to receive data pertaining to the external function block, stores the received data according to a configuration protocol of the internal function block and provides the stored external function block data to the internal function block according to the configuration protocol of

the internal function block. The process controller may send data generated by the controller or the internal function block to the external function block using the communication protocol associated with the external function block.

Soltis et al. describe a system of shared SCSI storage devices and data storage device locks for managing shared data storage on a networked computer system, wherein the data and storage devices are shared by multiple users. When a user accesses the stored data for processing, a copy of the data is stored locally in a memory cache in the client such that the client can process the data locally. The data storage device locks control access to the storage blocks to maintain data consistency when processed data is written back to the shared storage device.

Wadsworth et al. describe dump and debug utilities that provide mechanisms for a network user to remotely examine and control software executing on an interface board connected elsewhere to the network. The dump and debug utilities are provided on workstations and generate network communication packets which are transmitted to the interface board. The interface board includes an interrupt-driven network driver program that responds to the dump/debug network packet to cause the desired dump/debug facilities to be executed.

While it may be possible to combine the process control network of Stevenson et al. with the data storage device lock system of Soltis et al., Applicant submits that there is no motivation to do. The only storage device or database mentioned in Stevenson et al. is database 156 in controller 12. While multiple clients (PCs 14) may access database 156, the data is not updated or altered by the clients. The data is input to the database by the field devices connected to the controller. Though not specifically described by Stevenson et al., it is known to those of skill in the art that such databases are configured so that the data from the field devices is partitioned. Thus, each field device inputs its data without updating or altering data from other field devices.

Accordingly, there is no need or motivation to provide locks as described in Soltis et al. either for access by the clients, or for inputs from the field devices. Further, there is no

teaching or suggestion to modify or combine Stevenson et al. and Soltis et al. that is found in the prior art and is not based on Applicant's disclosure. Thus, in addition to not meeting the third criteria for establishing obviousness, Applicant submits that the first criteria for establishing obviousness also is not met.

As Applicant previously noted, the use of Wadsworth et al. results in the interruption of on-going software processes. Without conceding that Wadsworth et al. can be combined with either Stevenson et al. or Soltis et al., Applicant submits that there is no motivation to do so, without interrupting the operation of the controller 12 in Stevenson et al. or the lock management system in Soltis et al. Thus, as was the case with Stevenson et al. and Soltis et al., Applicant submits that both the first and third criteria for establishing obviousness are not met with regard to Wadsworth et al.

With regard to having a reasonable expectation of success in combining the references, Applicant submits that in light of all the above stated reasons, there can be no expectation of success in combining Stevenson et al., Soltis et al. and/or Wadsworth et al. to obtain Applicant's methods or systems for modifying processing on a control device.

In summary and in light of the above remarks and Applicant's previous replies, Applicant submits that neither Stevenson el at., Soltis et al., nor Wadsworth et al., alone or in any combination, teach or suggest each and every feature of the methods or systems described by Applicant's independent claims, provide any motivation for making the combination, or provide any expectation of reasonable success in providing methods or systems for modifying processing on a control device. Thus, Applicant's independent claims 1, 11 and 19 are allowable, and Applicant's dependent claims 2-10, 12-18 and 20 which depend from independent claims 1, 11 and 19, respectively, are also allowable at least by dependency.

In addition, Applicant submits new claim 21 for consideration by the Examiner. New claim 21 incorporates the features of independent claims 1, 11 and 19. For the reasons given above with respect to claims 1, 11 and 19, Applicant suggests that claim 21 is allowable and allowance is respectfully requested.

CONCLUSION

Applicant believes this Response to be fully responsive to the present Final Office Action and Advisory Action. Thus, based on the foregoing Remarks, Applicant respectfully submits that this application is in condition for allowance. Accordingly, Applicant requests reconsideration and allowance of the application.

Applicant invites the Examiner to contact the Applicant's undersigned Attorney if any issues are deemed to remain prior to allowance.

Respectfully submitted,

Date: December 5, 2006
Customer No: 25181
Patent Group
Foley Hoag, LLP
155 Seaport Blvd.
Boston, MA 02210-2600

By: /Robert W. Gauthier/
Robert W. Gauthier, Reg. No. 35,153
Attorney for Applicants
Tel. No. (617) 832-1175
Fax. No. (617) 832-7000